Final

Explanation of Significant Difference from the Record of Decision for Basewide Operable Unit Sites

Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87

Mather, California

June 2010

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List of Acronyms

AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency (now AFRPA)
AFRPA	Air Force Real Property Agency
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DTSC	Department of Toxic Substances Control
ESD	Explanation of Significant Difference
FFA	Federal Facility Agreement
FT	Site designator short for “fire training”
IC	institutional control
LF	Site designator short for “landfill”
NCP	National Contingency Plan
OT	Site designator short for “other”
OU	operable unit
PCE	perchloroethene
ppm	parts per million
RAO	Remedial Action Objective
ROD	Record of Decision
SLUC	State Land Use Covenant
ST	Site designator short for “storage tank”
SVE	Soil Vapor Extraction
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TPH D	total petroleum hydrocarbons, reported as diesel
TPH-G	total petroleum hydrocarbons, reported as gasoline
USAF	United States Air Force
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

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1.0 Introduction

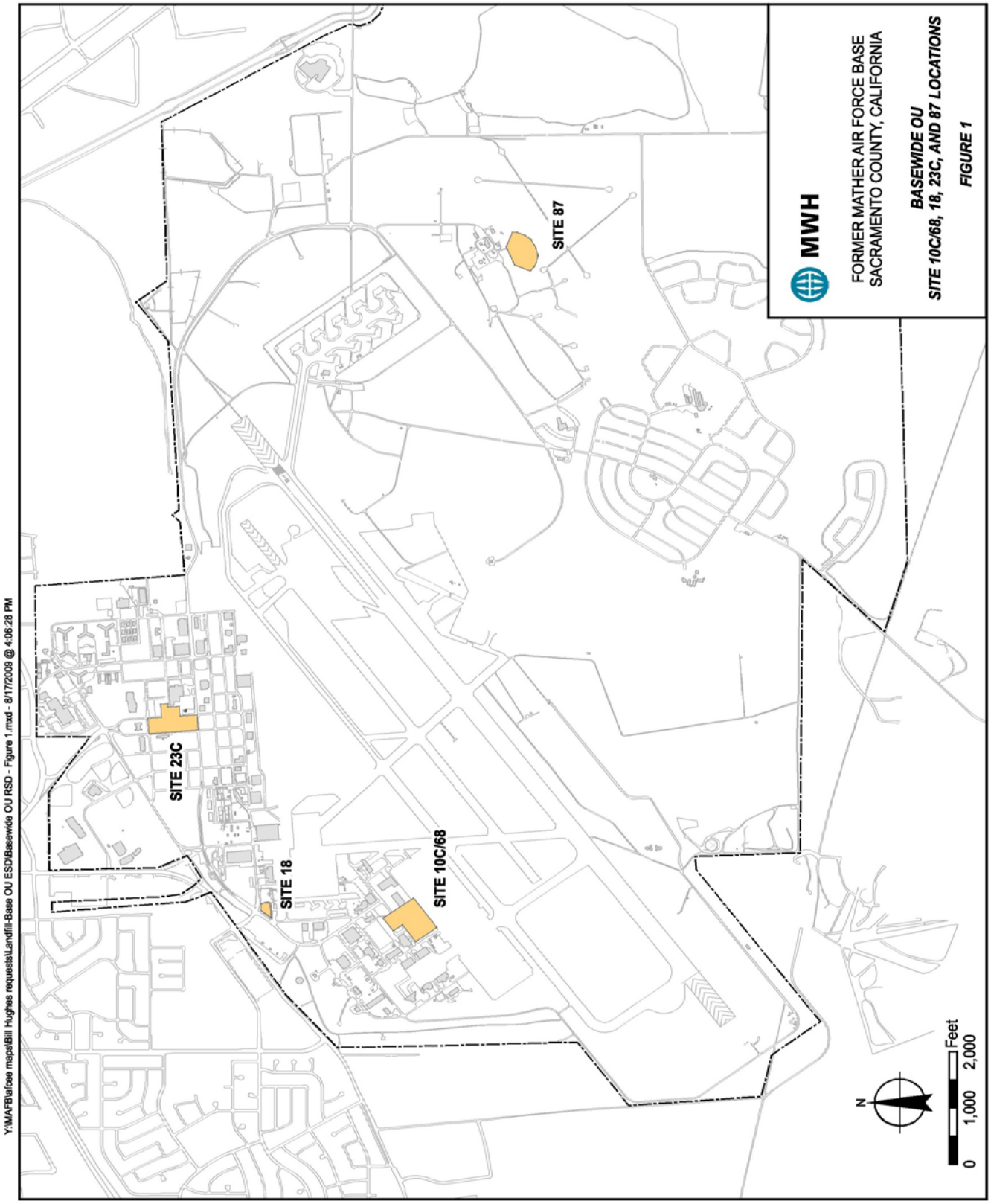
This document represents an Explanation of Significant Difference (ESD) from the Record of Decision (ROD) (AFBCA, 1998) for the Basewide Operable Unit (OU) sites at the former Mather Air Force Base (Mather) in Sacramento County, California. The ESD specifically addresses changes to a selected remedy to prevent exposure risk; changes to some cleanup levels from numerical to narrative standards; and the addition of institutional controls (ICs) to protect remedial systems at Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87. Figure 1 shows the location of these four Basewide OU sites. The Basewide OU ROD was signed in 1998 by the United States Air Force (USAF), the United States Environmental Protection Agency (U.S. EPA), and the State of California (State).

The Basewide OU Sites FT-10C/ST-68 (fire training area and underground storage tank facility) and OT-23C (dry cleaning facility and associated sewer lines) have ongoing remediation; both sites are undergoing soil vapor extraction (SVE), the remedy at FT-10C/ST-68 also has a bioventing component. Site OT-87 has undergone cleanup, but completion of a small mammal survey remains a requirement of the remedy. Basewide OU Site LF-18 (suspected old burial site, also suspected wash rack drainage area) is undergoing closure; the closure documentation is in review by the regulatory agencies.

The SVE piping system for Basewide OU Site LF-18 is connected to the SVE piping system and treatment plant for Soil OU Site SD-59. As a result, the piping system and wells are protected as part of the SD-59 remedy components in a separate ESD for the Soil OU remedies. In addition, Basewide OU Sites OT-23A, 23B, and 23D are being addressed by the SVE systems at Soil OU Sites ST-39 or SD-59. Therefore, the protection of remedy components for Sites OT-23A, 23B, and 23D are addressed as part of the remedy components for Site ST-39 in an ESD for the Soil OU remedies. However, ICs to prevent unacceptable risk from potential exposure to soil vapor in indoor air at Site LF-18 are addressed by this ESD.

This ESD, prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) at 40 Code of Federal Regulations 300.435 (c)(2)(i), documents and explains significant differences to the remedies selected in the 1998 ROD for the Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87. The U.S. EPA and State support the need for this ESD. This ESD will become part of the Administrative Record (AR) for the Mather Air Force Base Basewide OU. The AR is located at the Air Force Real Property Agency (AFRPA) office at 3411 Olson Street, McClellan, California, 95652 (for access, please call 916 643-6420). This ESD will also be available online at: https://afrpaar.lackland.af.mil/ar/docsearch.aspx

FIGURE 1: Location map, Basewide OU Sites 10C/68, 18, 23C, and 87



2.0 Summary of Site History, Contamination, and Selected Remedy

Mather is located in central California, about 10 miles east of downtown Sacramento, and consists of the area that was formerly Mather Air Force Base (AFB). The base occupied approximately 5,718 acres when closed in 1993. The topography consists of three relatively flat terraces, progressively lower to the north, and each sloping gently to the southwest. Surface water and groundwater flow are generally to the southwest, toward the Sacramento River. The water table is about 90 feet deep beneath the lowest terrace (the Riverbank Terrace), and about 160 feet deep beneath the highest terrace. Sites FT-10C/ST-68, LF-18 and OT-23C are located on the lowest terrace; Site OT-87 is located on the informally named Middle Terrace.

The base was first activated in 1918 as a combat pilot training school. It was placed on inactive status from 1922 until 1930, reactivated in 1930, then inactivated again from 1932 until 1941. The base reopened in 1941 as a pilot and navigator training post. After World War II, Mather AFB was the sole aerial navigation school for the United States military and its allies. In addition to the training conducted by the 323rd Flying Training Wing, Mather AFB hosted the Strategic Air Command 320th Bombardment Wing from 1958 to 1989 and hosted the 940th Air Refueling Group from 1976 to 1993.

The Aircraft Control and Warning Site at Mather was listed on the National Priorities List in 1987, followed by expansion of the listing to include the entire base in 1989. The USAF, U.S. EPA, and the State of California entered into a Federal Facility Agreement (FFA) in 1989 (USAF, 1989). The State of California is represented by the Department of Toxic Substances Control (DTSC), which, in turn, coordinates with other State regulatory agencies such as the Central Valley Regional Water Quality Control Board and Integrated Waste Management Board. Throughout this document the term “State of California” is used to refer collectively to the DTSC and other State agencies; communication to the State will be to DTSC who will in turn coordinate with the Central Valley Water Board, IWMB, and any other State agencies as appropriate.

To facilitate investigation and cleanup of Mather the suspected contaminated areas were organized into six OUs based on specific site characteristics with a total of 89 sites. Investigation efforts are completed for all sites in the OUs. Final response actions were recommended according to CERCLA guidance in proposed plans, comments solicited from the public, and selected response actions documented in the RODs for the six operable units (AFBCA, 1993; AFBCA, 1995; AFBCA, 1996; AFBCA, 1998a; AFRPA, 2006).

2.1 Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87: Site History

This section summarizes the history and contamination at Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87. This ESD documents and explains significant differences to the remedies selected in the 1998 ROD for the Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87 (see Section 3).

2.1.1 Site FT-10C/ST-68 History

Site FT-10C/ST-68 is the location of the Site FT-10C fire training area and related contamination, and the Site ST-68 fuel storage tank systems. Contamination at Site FT-10C consists of fuel components and chlorinated solvents and also some buried material apparently related to fire training. The fuel components and solvents are being treated by a SVE system. Buried debris was excavated in 1996 and consolidated in landfill site LF-04 under removal authority. Some additional debris was later unearthed during exploratory trenching. An area of lead-contaminated soil was remediated by excavation under the authority of the Excavation of Shallow Soil Contaminated with Lead at Site 10C/68 ESD dated June 2008, with signatures completed in August 2008.

2.1.2 Site LF-18 History

Site LF-18 was originally identified as a site where burial of general refuse and ethyl mercaptan had reportedly occurred in the 1940's. Investigation failed to find evidence of buried material, but chlorinated solvents were found in soil at the site, apparently related to runoff from the nearby airfield where aircraft maintenance may have occurred. These solvents have been addressed by a soil vapor extraction system and a treatment plant located at adjacent Soils OU Site SD-59.

2.1.3 Site OT-23C History

Site OT-23C is a part of Site OT-23, the portion of the Main Base sanitary sewer system associated with soil contamination. Site OT-23C consists of the site of a former dry cleaners and the associated sewer system from which solvents associated with the dry cleaning apparently escaped. The primary contaminant at Site OT-23 is perchloroethene (PCE), but other chlorinated solvents and fuel components have also been detected. The site is being remediated using a SVE system.

2.1.4 Site OT-87 History

Site OT-87 is the location of the former Rod and Gun Club Skeet and Trap Range (Facility 10330). The site contained remnants of clay pigeons and lead shot prior to the remedial action that occurred in 1998 and 1999 (Montgomery Watson, 1999). The remedial action consisted of excavation, separation of lead shot, treatment of lead-bearing soil, and disposal of the treated soil in the landfill at Site WP-07 in accordance with the CERCLA ROD, Basewide OU Sites (AFBCA, 1998). No further cleanup action is planned at Site 87; however, small mammal monitoring required as part of the remedy remains to be completed and ongoing ICs (i.e., land use restrictions) must be maintained as required by the remedy.

2.2 Selected Remedies for Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87

This section summarizes the major components of the remedy selected for each Basewide OU site for which this ESD presents significant differences. Since this ESD only presents differences for Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87 (see Figure 1 showing locations of these Basewide OU sites), it does not address the other Basewide OU sites.

2.2.1 Site FT-10C/ST-68 Remedy

Sites FT-10C and ST-68 were combined for the purpose of implementing in situ treatment to remediate volatile constituents. The remedial action selected for Site FT-10C/ST-68, Former Fire Department Training Area No. 3/Two 2,000 Gallon and Sixteen 50,000 Gallon Underground Storage Tanks at Fuel Transfer Station, included the following major components:

- In situ treatment with a SVE system of the fuel contaminated subsurface soils at Sites FT-10C and ST-68;
- Treatment of off-gas by granular activated carbon, or a more cost-effective means of best available control technology, as necessary to comply with applicable or relevant and appropriate requirements (ARARs); and,
- Monitor any thermal treatment effluent for dioxins (at least three sampling events during the first month of operation) and conduct a risk assessment if emissions exceed 0.2 nanograms per dry standard cubic meter.

This ESD establishes ICs to protect the Site FT-10C/ST-68 remedial system components including the SVE system and associated monitoring wells; ICs to prevent potential health risks due to soil disturbance and/or vapor intrusion; and also changes cleanup levels for petroleum hydrocarbons from numerical to narrative standards. These changes are described in Section 3 of this ESD.

2.2.2 Site LF-18 Remedy

The remedial action selected for Site LF-18 included the following major components:

- In situ treatment with a SVE system (comprised of extraction wells and possibly passive injection wells) of the trichloroethene (TCE), cis-1,2-dichloroethene, and other solvents that have contaminated subsurface soils at Site LF-18; and
- Treatment of off-gas by granular activated carbon, or a more cost-effective means of best available control technology, as necessary to comply with ARARs.

This ESD establishes ICs to prevent potential health risks due to soil disturbance and/or vapor intrusion. The ICs are described in Section 3 of this ESD.

2.2.3 Site OT-23C Remedy

The remedial action selected for Site OT-23C included the following major components:

- In situ treatment with a SVE system (comprised of extraction wells and passive injection wells) of the PCE and other solvents that have contaminated subsurface soils at Site OT-23;
- Treatment of off-gas by granular activated carbon, or a more cost-effective means of best available control technology, as necessary to comply with ARARs; and,
- Monitor any thermal treatment effluent for dioxins (at least three sampling events during the first month of operation) and conduct a risk assessment if emissions exceed 0.2 nanograms per dry standard cubic meter.

This ESD establishes ICs to protect the Site OT-23C remedial system components including the SVE system and associated monitoring wells, and ICs to prevent potential health risks due to soil disturbance and/or vapor intrusion. The ICs are described in Section 3 of this ESD.

2.2.4 Site OT-87 Remedy

The remedial action selected for Site OT-87 included the following major components:

- Excavation of approximately 28,000 cubic yards of lead-contaminated soil and sediments to a 6-inch depth through the fall zone of the lead shot;
- Stabilization (if needed for disposal) of approximately 28,000 cubic yards of lead-contaminated soil and sediments;
- If surface water is present, construction of diversion dams and removal of dams after completion of excavation;

- Transportation of the excavated soils, stabilized as necessary, to Site 7 for use as foundation material in construction of a cap, or to an off-base facility if Site 7 acceptance criteria are not met (Site 7 is a former landfill pit that was undergoing closure by capping in accordance with the ROD for the Soil OU [AFBCA, 1996]);
- Backfill or re-contour excavated site to create effective drainage; and,
- Implementation of institutional controls with the goal of protecting human health.

The Basewide OU ROD also has an additional requirement identified in the text*:*

> The Air Force will perform monitoring to insure that the residual levels of lead left in place at Site 87 do not represent a hazard to small mammals and waterfowl. To accomplish this, monitoring of lead levels in small mammal tissue will be required on an annual basis for three years, with the results evaluated in an annual monitoring report to the regulatory agencies. In addition, any dead waterfowl found in the area of Site 87 must be reported to the regulatory agencies, and necropsied by a certified laboratory for signs of lead toxicity. The details of the monitoring program will be worked out cooperatively between the Air Force and the regulatory agencies.
>
> If small mammal tissue lead levels are lower than those reported to cause adverse effects [Eisler 1998] after a minimum of two years of monitoring, then monitoring will be discontinued upon agreement by the regulatory agencies. If small mammal tissue lead levels are higher than those reported to cause adverse effects [Eisler 1998] after a minimum of two years of monitoring, then further ecological investigation and re-evaluation of the lead cleanup level will be conducted. The Air Force may have to undertake additional remedial action to reduce lead levels at Site 87.

Section 3 of this ESD addresses the imposition of ICs that are selected as a part of the remedy for Site OT-87 and provides any necessary clarifications concerning the implementation of ICs.

3.0 Description of and Basis for the Significant Differences

3.1 Changes to the Cleanup Levels

The Basewide OU ROD provided narrative soil cleanup levels for the vadose zone in order to minimize further degradation of the groundwater from contaminants of concern in the soil. The ROD specified a methodology and relevant factors for consideration. Notwithstanding these narrative cleanup levels, the ROD also imposed artificially low numeric cleanup levels for total petroleum hydrocarbons (TPH) in the diesel (TPH-D) fuel range and in the gasoline(TPH-G) range at Site FT-10C/ST-68, based on conservative assumptions about solubility and environmental attenuation of petroleum contaminants. Rather than use artificially low numeric cleanup levels, this ESD removes the numeric cleanup levels and applies the existing narrative soil cleanup levels to these contaminants of concern. This ESD also adds a methodology for imposing ICs that address the threat to human health posed by indoor air contaminated with chemicals volatilizing from the shallow soil (vapor intrusion). Use of the narrative soil cleanup levels, in conjunction with this new methodology for addressing vapor intrusion, will adequately protect human health and the environment pursuant to CERCLA and the NCP.

3.1.1 Application of the Narrative Soil Cleanup Levels

This ESD applies the following narrative soil cleanup levels to the remediation of TPH-D and TPH-G at Site FT-10C/ST-68:

> The goal of cleaning up the vadose zone is to minimize further degradation of the groundwater by the contaminants in the soil. It is generally preferable from a technical and cost perspective to clean up contamination in the vadose zone before it reaches the groundwater. The soil cleanup standard will be achieved when the residual vadose zone contaminants will not cause the groundwater cleanup standard, as measured in groundwater wells monitoring the plume, to be exceeded after the cessation of the groundwater remediation. The Air Force will make the demonstration that the standard has been met through contaminant fate and transport modeling, trend analysis, mass balance, and/or other means. This demonstration will include examination of the effects of the residual vadose zone contamination in the groundwater using VLEACH or another appropriate vadose zone model, in conjunction with a groundwater fate and transport model, to predict the resulting concentration from this residual vadose zone contamination in the nearest groundwater wells monitoring the site. This demonstration can be made prior to the cessation of groundwater remediation. The Air Force shall provide verification, through actual data, that the above standard has been met. The signatory parties to this ROD will jointly make the decision that the soil cleanup standard has been met.

The Air Force shall operate the SVE system until it makes the demonstration that the cleanup standard, set forth above, has been met. The Air Force shall continue to operate the SVE system if appropriate, after considering the following factors:

- whether the mass removal rate is approaching asymptotic levels after temporary shutdown periods and appropriate optimization of the SVE system;
- the additional cost of continuing to operate SVE system at concentrations approaching asymptotic mass levels;
- whether the predicted concentration of the leachate from the vadose zone using VLEACH or another appropriate vadose zone model that interprets soil gas data will exceed the groundwater cleanup standard;
- the predicted effectiveness and cost of further enhancements to the SVE system (e.g., additional vapor extraction wells);
- whether the cost of groundwater remediation will be significantly more if the residual vadose zone contamination is not addressed;
- whether the residual mass in the vadose zone will significantly prolong the time to attain the groundwater cleanup standard; and
- the incremental cost over time of vadose zone remediation compared to the incremental cost over time for groundwater remediation on the basis of a common unit (e.g., cost of a pound of TCE removed) provided that the underlying groundwater has not reached aquifer cleanup levels.

The signatory parties agree that the Air Force may cycle the SVE system on and off in order to optimize the SVE operation and/or evaluate the factors listed above.

Once SVE is terminated in accordance with the demonstration described in the preceding paragraphs quoted from the ROD, the USAF will reevaluate the need to implement bioventing in accordance with the ROD.

3.1.2 Deletion of the Numeric Soil Cleanup Levels from the ROD

Table 2-18 on page 2-50 of the Basewide OU ROD currently reflects a cleanup level of 100 parts per million (ppm) and 10 milligrams per liter for TPH-D and 5 ppm for TPH-G. These cleanup levels were not appropriate for the site and remedy. This ESD deletes these numeric cleanup levels for TPH-D and TPH-G and replaces them with a narrative standard that directly relates the cleanup levels to protection of human health and the environment.

3.2 Institutional Controls

The U.S. EPA and the State each previously raised concerns about lack of detail provided in the Basewide OU ROD regarding the imposition, implementation, and management of ICs. The U.S. EPA and the State recommended that details be clarified in a decision document. Since 1998 when the ROD was issued, the USAF has developed additional IC policies. ICs are added to, and considered an integral part of, the selected remedies that protect human health and the environment pursuant to CERCLA and the NCP. The USAF has also reached agreement with regulatory agencies on the IC implementation language and how to incorporate requirements related to California's State Land Use Covenants (SLUCs). Therefore, this ESD has been prepared to impose ICs, provide the IC implementation language, and address SLUC requirements for the Basewide OU remedial actions, but especially to explicitly impose ICs to protect the Basewide OU remedial systems.

This ESD defines the Remedial Action Objectives (RAOs) for the ICs; imposes specific ICs for the Basewide OU sites (i.e., FT-10C/ST-68, LF-18, OT-23C[1]; and OT-87 [Note: Site LF-18 remedy components are protected along with Site SD-59 remedy components in the Groundwater and Soil OU ESD]); depicts the geographic locations where ICs apply; and explains IC duration.

The significant differences from the Basewide OU ROD that are established by this ESD consist of either explicitly adding ICs to the selected remedies or providing clarifying detail for other ICs. This ESD also explains the requirement for property recipients of any property subject to these ICs to enter into a SLUC allowing the State to enforce the ICs imposed by the ROD and this ESD.

3.2.1 Remedial Action Objectives for the Basewide OU Sites with ICs

ICs are non-engineering, non-technical mechanisms used to reduce or prevent human exposure to contaminants. The following IC objectives are hereby established for Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87. Because these ICs become part of the selected remedies for Basewide OU sites, they have associated RAOs until the remedial action is complete.

[1] Because the land parcels associated with Site OT-23C have already been transferred by the USAF, imposing ICs by amending the deed and/or executing a SLUC may only be accomplished with the property owner's agreement.

The RAOs for these ICs are: 1) preventing unacceptable human exposure to soil vapor or residual contamination at Basewide OU Sites FT-10C/ST-68, LF-18, OT-23C, and OT-87; 2) protecting the integrity of the remedial systems, including the associated monitoring systems at Sites FT-10C/ST-68, and OT-23C; and, 3) preserving necessary access to the remedial system(s) and associated monitoring systems at Sites FT-10C/ST-68, LF-18, and OT-23C. The specific ICs would be documented as environmental restrictive covenants in deeds and restrictions/prohibitions in SLUCs.

3.2.2 Imposition and Implementation of Institutional Controls

Concentrations of aviation fuel or benzene or chlorinated solvents at Sites FT-10C/ST-68, LF-18, and OT-23C may present unacceptable risk to human health through inhalation of indoor air should a building be constructed and occupied above volatile organic compound (VOC) contamination. Therefore, as part of the remedies originally selected in the Basewide OU ROD (AFBCA, 1998) for Sites FT-10C/ST-68, LF-18, and OT-23C, the USAF will impose the following ICs, if necessary, to prevent health risks from exposure to VOC contaminated soils (see Section 3.2.3 for the areas where these ICs are applicable). The property recipient will be prohibited from:

- engaging in any surface or shallow soil disturbance (in the geographic area subject to the IC), until and unless it is demonstrated that VOC contamination at these site(s) is no longer a threat to human health and the environment; and
- constructing any structures for human occupation (in the geographic area subject to the IC) without evaluating or addressing the risks posed by vapor intrusion.

These ICs will be imposed only if necessary. The USAF will determine if ICs are necessary nearer the time of transfer. If the site soil gas data demonstrates that all of the soil gas concentrations for each contaminate of concern are compatible with unrestricted land use, then the USAF will not impose these ICs.

The USAF imposes the following ICs to protect the remedial systems at the sites. The transferee will be prohibited from:

- damaging/disturbing/tampering with, or allowing others to damage/disturb/tamper with, the remediation system components, including but not limited to the extraction and injection systems, treatment systems, conveyance pipes, electrical, gas, or fiber optic lines, or monitoring wells, until such time as remediation is complete or components are no longer to be used for remediation;
- engaging in, or allowing others to engage in, activities that interfere with the effectiveness of any remediation system component; and

- engaging in, or allowing others to engage in, activities that would limit access for the Air Force, U.S. EPA, or the State to any equipment or systems associated with the soil remediation system components.

As part of the remedy originally selected in the Basewide OU ROD (AFBCA, 1998) for Site OT-87, the USAF will impose the following ICs to prevent health risks from exposure to soils contaminated with lead. The ROD merely stated that, "institutional controls will be implemented with the goal of protecting human health", and provided as a reason that, "institutional controls provide further protection of human health and the environment." This ESD clarifies that the ICs that are to be implemented will prohibit the transferee from:

- *Residential Development:* Grantee covenants for itself and its successors and assigns that it will not use, or allow others to use the designated Site 89 area for residential development, or construction of schools, day care facilities for children, or hospitals for human care, and that any uses of the site that would allow exposure to the buried contaminated soils by the public will be prohibited.

- *Disturbance of Soil:* Grantee covenants for itself and its successors and assigns that it will not disturb or allow others to disturb the soil where it may contain elevated lead concentrations (Figure 5), without prior approval from the ROD signatory agencies to ensure that the activity will not compromise protection of human health and the environment. This includes any activities that would alter drainage, or sub-drainage in the area.

3.2.2.1 Implementation

The IC alternative includes enforceable use restrictions in the form of ICs on the use of certain properties. Specific language is included in this ESD describing the responsibility of the USAF for implementing, monitoring, reporting on, and enforcing the ICs. Although the USAF is transferring responsibilities to the transferee and its successors by provisions to be included in the deed(s) transferring title to the property and may contractually arrange for third parties to perform any and all of the actions associated with the ICs, the USAF is ultimately responsible for the remedy (including ICs) before and after property transfer. The USAF will exercise this responsibility in accordance with CERCLA and the NCP. Therefore, compliance with the terms of this ESD will be protective of human health and the environment. Because the restrictions are specifically described below and the means for implementing the restrictions are detailed herein, it is not necessary for the USAF to submit any new post-ROD, ICs implementation documents, such as a Land Use Control Implementation Plan, new operation and maintenance plans, or remedial action work plan.

Meeting the RAOs shall be the primary and fundamental indicator of ICs performance, the ultimate aim of which is to protect human health and the environment. Performance measures

for the ICs are the RAOs plus the actions necessary to achieve those objectives. It is anticipated that successful implementation, operation, maintenance, and completion of these measures will achieve protection of human health and the environment and compliance with all legal requirements.

The USAF may contractually arrange for third parties to perform any and all of the actions associated with the ICs, although the USAF is ultimately responsible under CERCLA for the successful implementation of ICs, including monitoring, maintenance, and review of the ICs. Maintenance, monitoring, and other controls as established in accordance with this ESD and the appropriate transfer documents will be continued until the ICs are no longer necessary. ICs shall be maintained until the concentrations of hazardous substances in the soil are at such levels as to allow for unrestricted use and exposure.

3.2.2.2 Restrictions Prior to Property Transfer

The sites for which ICs are being selected are currently leased by the USAF. During the time between the adoption of this ESD and deeding of the property, equivalent restrictions will be implemented pursuant to the terms of the existing lease which requires the approval of the USAF for any construction or soil disturbance activity. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by equivalent use restrictions to be included in the federal deed and the SLUC as described in this ESD.

3.2.2.3 Deed Restrictions and Reservation of Access

The Federal deed(s) for any property including Sites FT-10C/ST-68, LF-18, OT-23C, or OT-87 will include a description of the residual contamination on the property, consistent with the USAF's obligations under CERCLA Section 120(h) and the specific restrictions set forth in this Section. The Federal deeds may require additional specific restrictions from RODs addressing other residual contamination on the property. ICs, in the form of deed restrictions, are "environmental restrictions" under California Civil Code Section 1471 (Section 1471). The deeds will include legal description of the property to which the ICs apply and will contain the provisions required by Section 1471 to qualify the ICs as "environmental restrictions" so that they run with the land.

The USAF and regulatory agencies may conduct inspections of the ICs and the affected property. The deeds or associated transaction documents will also contain a reservation of access to the property for the USAF, the U.S. EPA, and the State of California, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the USAF

Installation Restoration Program or the FFA. The USAF will provide such access to regulatory agencies prior to transfer.

The environmental restrictions are the basis for part of the CERCLA Section 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more or known to have been released or disposed of on the property.

For any deed (for conveyance to a non-Federal entity) or letter of transfer (to a Federal entity) transferring all or part of any parcel including sites FT-10C/ST-68, LF-18, OT-23C, and OT-87, ICs in the form of land use restrictions, will be incorporated in the deed as grantee environmental restrictive covenants, in substantially the following language:

For Sites FT-10C/ST-68, LF-18, and OT-23C:

- *The Grantee covenants and agrees for itself and its successors and assigns that it will not engage in, or allow others to engage in, any surface or shallow soil disturbance activities on the Property except in connection with construction that complies with the institutional control that addresses vapor intrusion.*

- *With respect to risks that may be posed via indoor air contaminated by chemicals volatilizing from shallow soil gas (vapor intrusion), the Grantee covenants and agrees for itself and its successors and assigns either to (a) design and construct structures intended for occupancy within the area depicted on Exhibit ___ [in the geographic area subject to this IC] in a manner that would mitigate unacceptable risk under CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (for example, through installation of a vapor intrusion barrier or gas collection system); or (b) evaluate the potential for unacceptable risk prior to the erection of any new, occupied structure in the same area, and include mitigation of the vapor intrusion in the design/construction of the structure prior to occupancy if an unacceptable risk is posed under CERCLA and the NCP. The Grantee will coordinate any and all evaluation and potential mitigation measures with U.S. EPA and the State.*

- *The Grantee covenants and agrees for itself and its successors and assigns that it will not damage/disturb/tamper with, or allow others to damage/disturb/tamper with, any of the remediation system components including, but not limited to, the extraction and injection systems, treatment systems, conveyance pipes, electrical/gas/fiber optic lines, or monitoring wells on the Property.*

- *The Grantee covenants and agrees for itself and its successors and assigns that it will not engage in, or allow others to engage in, activities that interfere with the effectiveness of any remediation system component on the Property.*

- *The Grantee covenants and agrees for itself and its successors and assigns that it will not engage in, or allow others to engage in, any activities that would limit access for the USAF, the U.S. EPA, and the State, and their respective officials, agents, employees, contractors, and subcontractors to any equipment/facilities/infrastructure associated with the remediation system components used in soil remediation on the Property.*

For Site OT-87:

- *The Grantee covenants and agrees for itself and its successors and assigns that it will not engage in, or allow others to engage in, any surface or shallow soil disturbance activities within the area identified in Exhibit__ [in the geographic area subject to this IC] (this includes any activities that would alter drainage, or sub-drainage, in the area), until and unless it is demonstrated that lead concentrations in the soil at this site are no longer a threat to human health and the environment, and without first obtaining written approval from the Air Force, U.S. EPA, and the State.*
- *The Grantee covenants and agrees for itself and its successors and assigns that it will not use, or allow others to use, the Property within the area identified in Exhibit__ [in the geographic area subject to this IC] for residential purposes (including mobile or modular homes), hospitals for human care, public or private schools for persons under 18 years of age, nursery schools, or for day care centers for children.*

For any deed (for conveyance to a non-Federal entity) or letter of transfer (to a Federal entity) transferring all or part of any parcel containing any portion of the Basewide OU Sites FT-10C/ST-68, LF-18, and OT-23C, or OT-87, access for the U.S. Air Force and U.S. EPA will be maintained by substantially the following language incorporated in the deed(s):

> *The United States retains and reserves a perpetual and assignable easement and right of access on, over, and through the Property, to enter upon the Property in any case in which a remedial action or corrective action is found to be necessary on the part of the United States, without regard to whether such remedial action or correction action is on the Property or on adjoining or nearby lands. Such easement and right of access includes, without limitation, the right to perform any environmental investigation, survey, monitoring, sampling, testing, drilling, boring, coring, test pitting, installing monitoring or pumping wells or other treatment facilities, response action, corrective action, or any other action necessary for the United States to meet its responsibilities under applicable laws and as provided for in this instrument. Such easement and right of access shall be binding on the Grantee and its successors and assigns and shall run with the land.*
>
> *In exercising such easement and right of access, the United States shall provide the Grantee or its successors or assigns, as the case may be, with reasonable notice of its intent to enter upon the Property and exercise its rights under this clause, which notice may be severely curtailed or even eliminated in emergency situations. The United States shall use reasonable means to avoid and to minimize interference with the Grantee's work*

and the Grantee's successors' and assigns' quiet enjoyment of the Property. At the completion of work, the work site shall be reasonably restored. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the Property at a reasonable charge to the United States. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the Grantee, nor its successors and assigns, for the exercise of the easement and right of access hereby retained and reserved by the United States.

In exercising such easement and right of access, neither the Grantee nor its successors and assigns, as the case may be, shall have any claim at law or equity against the United States or any officer or employee of the United States based on actions taken by the United States or its officers, employees, agents, contractors of any tier, or servants pursuant to and in accordance with this clause: Provided, however, that nothing in this paragraph shall be considered as a waiver by the Grantee and its successors and assigns of any remedy available to them under the Federal Tort Claims Act.

For any deed (for conveyance to a non-Federal entity) or letter of transfer (to a Federal entity) transferring all or part of any parcel containing any portion of Basewide OU Sites FT-10C/ ST-68, LF-18, and OT-23C, or OT-87, access for the State of California will be maintained by substantially the following language incorporated in the deed(s):

State Access to Property. The right of access reserved to the United States in subparagraph [insert reference to three preceding paragraphs] above may be exercised by agencies of the United States, including, but not necessarily limited to the USAF and the USEPA Region IX. Further, notice is hereby given that the USEPA Region IX, the USAF, and the State of California have entered into an agreement commonly referred to as a Federal Facility Agreement (FFA); that, pursuant to the FFA, the USAF has a continuing duty to provide access to the property to the State of California; and that, the USAF will extend to the State of California, as necessary, the right to use the access reserved in subparagraph [insert reference to three preceding paragraphs] above. This right of access is for purposes, either on the Property or on adjoining lands, consistent with the Installation Restoration Program of the Grantor or the FFA, if applicable.

3.2.2.4 Notice of Institutional Controls

The USAF will include the specific deed restriction language set forth in this ESD in the deed for any parcel including Sites FT-10C/ST-68, LF-18, OT-23C, or OT-87, and will provide a copy of the deed or other transfer documentation containing the use restrictions to the regulatory agencies as soon as practicable after transfer of fee title. The USAF will inform the property owner(s) of the necessary ICs in the draft deed.

Concurrent with the transfer of fee title from the USAF to the transferee, the Finding of Suitability for Transfer/Early Transfer and the location of the AR file will be communicated in writing to the property owners and to appropriate state and local agencies (with a copy to U.S. EPA) with authority regarding any of the activities or entities addressed in the controls to ensure that such agencies can factor the information into their oversight, approval, and decision-making activities regarding the property.

Prior to conveyance of any USAF property including Sites FT-10C/ST-68, LF-18, OT-23C, or OT-87, U.S. EPA and State representatives will be given reasonable opportunity to review and comment on the applicable deed language described in this section and associated rights of entry for purposes of IC oversight and enforcement.

The USAF will provide notice to U.S. EPA and State at least six (6) months prior to any transfer or sale of property. If it is not possible for the facility to notify U.S. EPA and State at least six months prior to any transfer or sale, then the facility will notify U.S. EPA and State as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. Additionally, the USAF further agrees to provide U.S. EPA and State with similar notice, within the same time frames, as to federal-to-federal transfers of property.

3.2.2.5 Annual Evaluations/Monitoring

Prior to property transfer, the USAF will conduct annual monitoring, provide annual reports describing whether property use has conformed to ICs or use restrictions, and undertake prompt action to address activity that is inconsistent with the IC objectives or use restrictions, or any action that may interfere with the effectiveness of the ICs. The monitoring results will be included in a separate report or as a section of another environmental report, if appropriate, and provided to the U.S. EPA and State. The annual monitoring reports will be used in preparation of the Five Year Review to evaluate the effectiveness of the remedy. Prior to transfer, the annual monitoring report submitted to the regulatory agencies by the USAF will evaluate the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed.

Upon the effective date of property conveyance, the transferee (or other entity accepting such obligations [which may include, without limitation, subsequent transferees] or subsequent property owner(s)) will conduct annual physical inspections of property including Sites FT-10C ST-68, LF-18, OT-23C, or OT-87 to confirm continued compliance with all IC objectives unless and until the ICs at the site are terminated. The transferee or subsequent property owner(s) will provide to the USAF, the U.S. EPA, and State an annual monitoring report on the status of the ICs and how any IC deficiency or inconsistent uses have been addressed, whether use restrictions and controls were communicated in the deed(s) for any

property transferred in the reporting period, and whether use of the property encompassing the area subject to ICs has conformed to such restrictions and controls. The USAF will place these transferee obligations in the deed or other transfer documentation.

If a transferee fails to provide an annual monitoring report as described above to the USAF, the USAF will notify U.S. EPA and State as soon as practicable. If U.S. EPA or State does not receive the annual monitoring report from the transferee, it will notify the USAF as soon as practicable. Within 30 days of the report's due date, the USAF will take steps to determine whether ICs are effective and remain in place and advise the regulators of its efforts. In any event, within 90 days of the report's due date, the USAF shall determine the status of ICs and provide its written findings, with supporting evidence sufficient to confirm the reported status, based on the use restrictions/ICs and site conditions, to U.S. EPA and State unless either U.S. EPA or State, in its sole discretion, acts to confirm the status of the ICs independently.

The five-year reviews conducted by the USAF will also address whether ICs in the ROD and this ESD were inserted in the deed, if property was transferred during the period covered; if the owners and State/local agencies were notified of the ICs affecting the property, and whether use of the property has conformed to such ICs. Five-year reviews will make recommendations on the continuation, modification, or elimination of annual reports and IC monitoring frequencies. Five-year reviews are submitted by the USAF to regulatory agencies for review and comment.

Although the USAF is transferring procedural responsibilities to the transferee and its successors by provisions to be included in the deed(s) transferring title to the property including Sites FT-10C/ST-68, LF-18, OT-23C, or OT-87 and may contractually arrange for third parties to perform any and all of the actions associated with the ICs, the USAF is ultimately responsible for the remedy.

3.2.2.6 Response to Violations

Prior to property transfer, the USAF will notify U.S. EPA and the State as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs. The USAF will notify the U.S. EPA and State regarding how the USAF has addressed or will address the breach within 10 days of sending U.S. EPA and State notification of the breach.

The deed or other transfer documentation will require that post transfer, the transferee will notify the USAF, the U.S. EPA, and State of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs, and will address such activity or condition as soon as practicable, but in no case will the process be

initiated later than 10 days after the transferee becomes aware of the breach. Post-transfer, if the transferee fails to satisfy its obligations pursuant to the SLUC, the State may enforce such obligations against the transferee. If there is failure of the selected remedy or a violation of selected remedy obligations (for example, an activity inconsistent with IC objectives or use restrictions, or any action that may interfere with the effectiveness of the ICs), the State will notify the USAF and U.S. EPA in writing of such failure as soon as practicable (but no longer than 14 days) upon discovery of the inconsistent activity or action that interferes with the effectiveness of the IC, and initially seek corrective action or other recourse from the transferee. If, after diligent efforts, the State is unable to enforce the obligations of the SLUC or remedy obligations against the transferee, within 21 days following the State's notification, the parties shall confer to discuss re-implementation of the selected remedy or other necessary remedial actions to address the breach of the IC. Once the State reports that the transferee is unwilling or unable to undertake the remedial actions, the USAF will within 10 days inform the other Parties of measures it will take to address the breach.

3.2.2.7 Approval of Institutional Control Modification or Termination

Prior to transfer, the USAF shall not modify or terminate ICs or implementation actions, modify land use, or modify use restrictions that are part of the selected remedy without approval by U.S. EPA and State. The USAF shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the ICs or any action that may alter or negate the need for ICs.

Any grantee of property constrained by the ICs imposed through their transfer document(s) may request modification or termination of an IC. Modification or termination of an IC, except the SLUC (discussed below), requires USAF, U.S. EPA, and State approval.

Any modification or termination of the SLUC must be undertaken in accordance with State law; and will be the responsibility of the transferee or then-current owner or operator.

3.2.2.8 State Land Use Covenants

The signed deed and/or other legally binding transfer documents between the USAF and the transferee will include the specific land use restrictions (i.e., ICs), as well as a condition that the transferee execute and record a SLUC, within 10 days of transfer, to address any State obligations pursuant to State law, including Title 22 California Code of Regulations (CCR), Section 67391.1. Portions of this regulation are added by this ESD to the ARARs in the Basewide OU ROD, as summarized in Table 1. Any letter of transfer (to a federal entity) will include a condition that future deeds to a non-federal entity include this requirement. The USAF will ensure that the transferee has met this condition.

TABLE 1: Basewide OU Relevant and Appropriate State Requirements added by this ESD

Requirement	ARAR Status	Source	Description
Action Specific			
Land Use Covenant	Relevant and Appropriate	Title 22, CCR, Section 67391.1(a)	Requires imposition of appropriate limitations on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land.
Land Use Covenant	Relevant and Appropriate	Title 22, CCR, Section 67391.1(d)	Requires that the land use covenant be recorded in the county where the land is located.
Land Use Covenant	Relevant and Appropriate	California Civil Code Section 1471(a) & (b)	Specifies requirements for land use covenants to apply to successors in title to the land.

CCR = California Code of Regulations

3.2.3 Geographic Locations Where Institutional Controls Apply

ICs for the protection of the remedial system components, and to preserve access to such components, apply to those geographic locations where the remedial system components are physically placed. The components of the USAF's remedial systems at Sites FT-10C/ST-68, LF-18, and OT-23C, are shown on Figures 2, 3, and 4 respectively; the ICs will be applied to the Site 10C/68 boundary shown in Figure 2. The ICs will be applied to the Site LF-18 boundary shown in Figure 3; in addition these components are protected under the Soil OU as they are part of a combined remedial system with Site SD-59. The property on which the Site OT-23C components are located has all been transferred by deed except for a small area south of Mather Boulevard and east of Whitehead Street; each deed containing any Site OT-23C remedy component shown on Figure 3 has provisions preserving rights of access for the Air Force, U.S. EPA and the State; and prohibiting interference with the remedial action components. No additional ICs are established by this ESD on property previously deeded. The components include as of the date of this ESD, for each site, soil vapor treatment system, extraction wells, piping, electrical and gas lines, monitoring wells, and associated fencing. Any additional components that have been or will be installed as a part of the remediation systems for Sites FT-10C/ST-68, LF-18, and OT-23C will also be subject to these ICs. There are currently no remedial system components at Site OT-87 to protect.

Some ICs may be imposed to eliminate or limit exposure pathways to human receptors in order to protect human health.

For Sites FT-10C/ST-68 and LF-18: Shallow soil gas sampling for the contaminants of concern at these sites must take place prior to transfer. If the site soil gas data demonstrates that all of the soil gas concentrations for each COC are compatible with unrestricted land use, then the USAF will not impose ICs. If soil gas data for one or more of these sites indicates an unacceptable risk associated with potential exposure to indoor air, then ICs to protect human health will be applied for that to the areas shown in the appropriate figures for that site or sites (Figure 2 for Site 10C/68, and Figure 3 for Site 18). These areas incorporate a buffer around each site because VOCs may be somewhat mobile in the subsurface. Covenant language for these ICs is included in Section 3.2.2.3.

If the ICs prohibiting surface and shallow soil disturbing activities are imposed, since these ICs are applicable in areas where the risks are acceptable for industrial uses, excavation and other soil disturbing activities may be allowed by the USAF, U.S. EPA, and the State if environmental and worker safety control measures are implemented.

For Site OT-87: The ICs would be imposed to eliminate or limit exposure pathways to human receptors by prohibiting soil disturbances and precluding residential or other similar sensitive receptor uses. The IC area for Site OT-87 is shown on Figure 5.

3.2.4 Duration of Institutional Controls

The USAF, represented by the AFRPA, is responsible for implementing, monitoring, and maintaining these remedies including ICs for the Basewide OU sites until and unless it is demonstrated that contamination at these locations is no longer a threat to human health and the environment.

The USAF recognizes that, at sites where contaminants are left in place above levels allowing unlimited use and unrestricted exposure, ICs are used to ensure that these contaminants do not pose an unacceptable risk to human health or the environment. Thus, where there is a failure to meet IC RAOs or a failure of IC implementation actions that could lead directly to remedy failure, the USAF acknowledges that the regulators may seek to reopen the remedy decision in addition to exercising any other authorities they may have under CERCLA. The USAF will not waive, modify, or terminate any Basewide OU site IC unless done in accordance with the ROD as modified by this ESD and deed provisions.

FIGURE 2: Site FT-10C/ST-68 Remediation System Components and IC Area

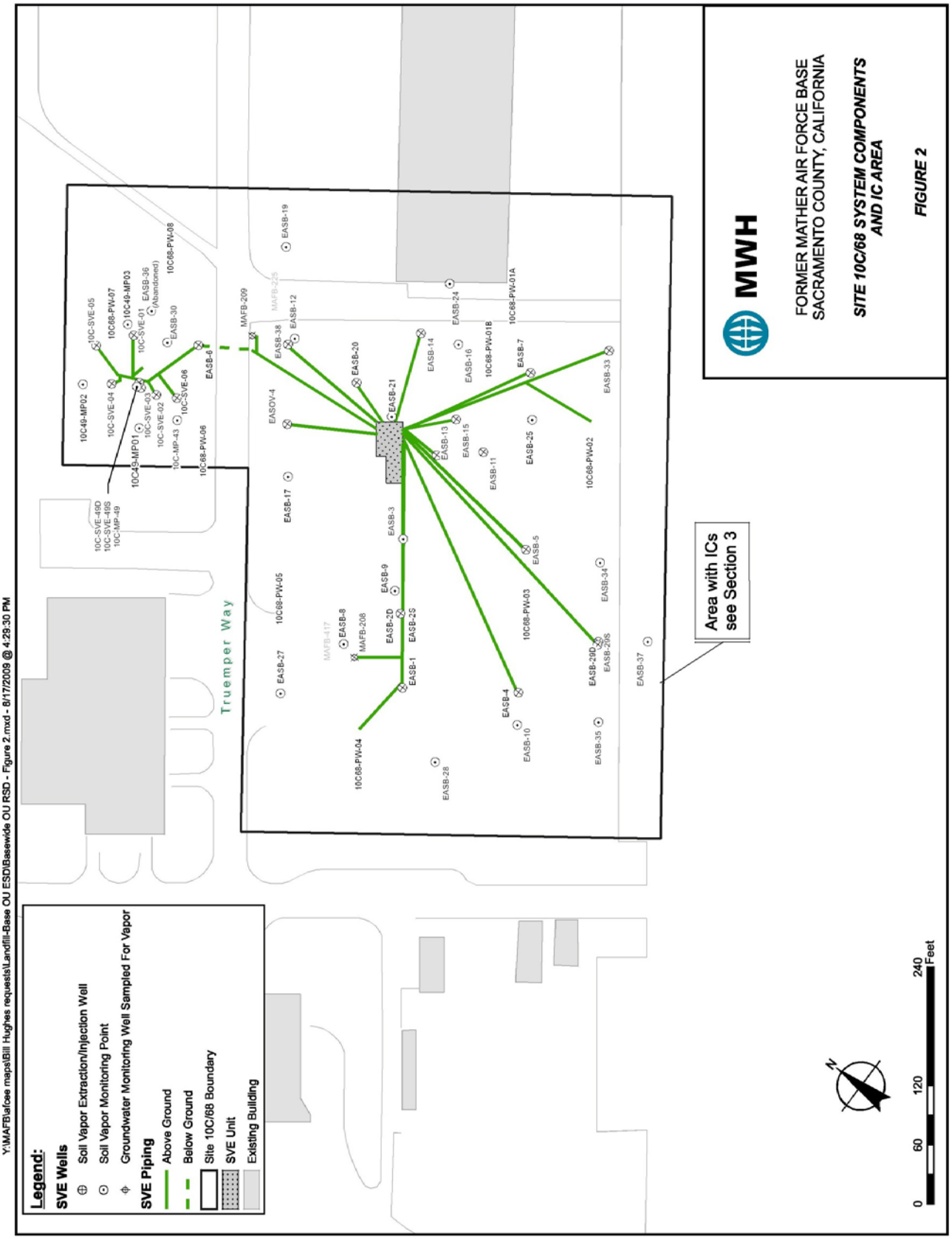


FIGURE 3: Site LF-18 Remediation System Components and IC Area

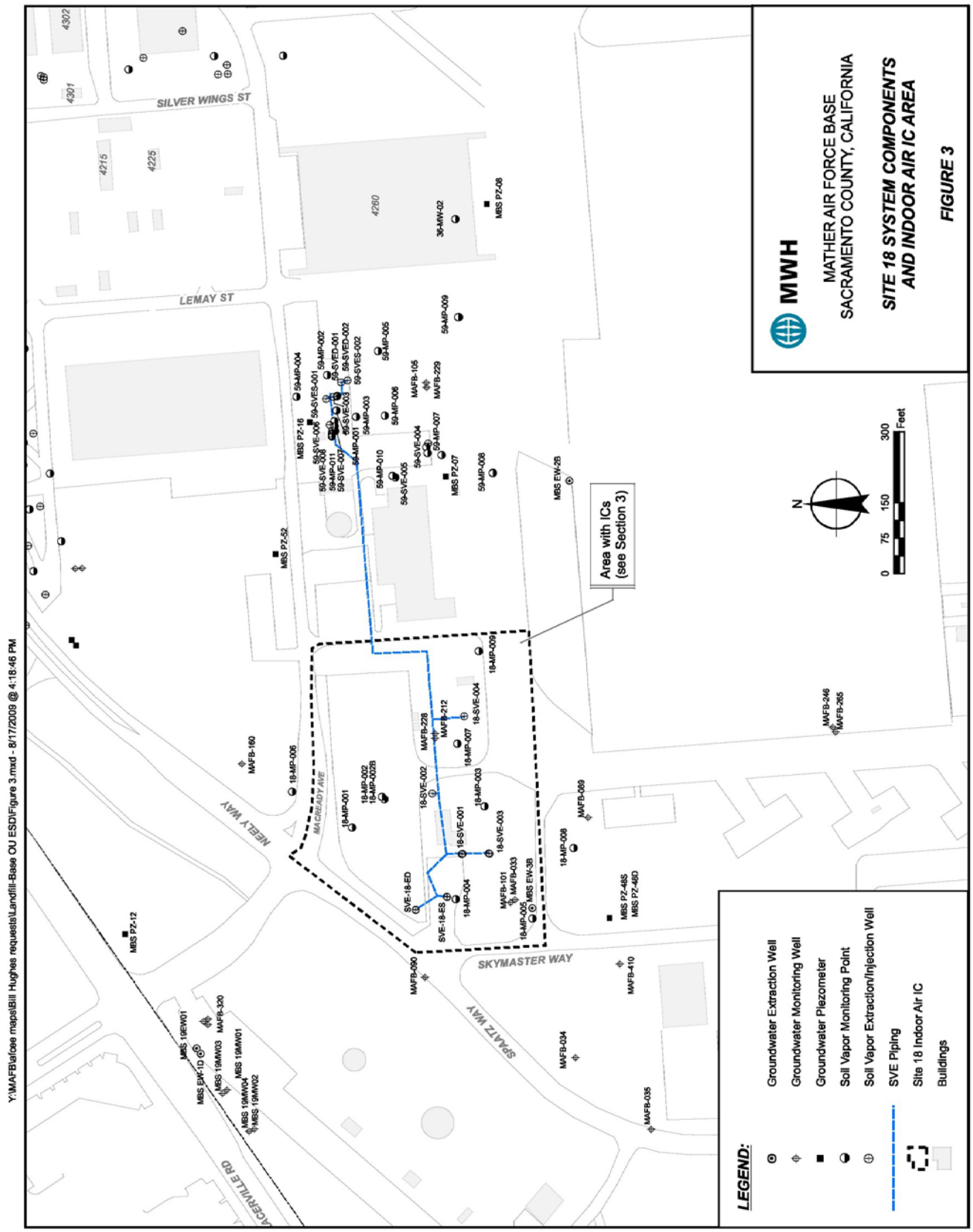


FIGURE 4: Site OT-23C Remediation System Components and IC Area

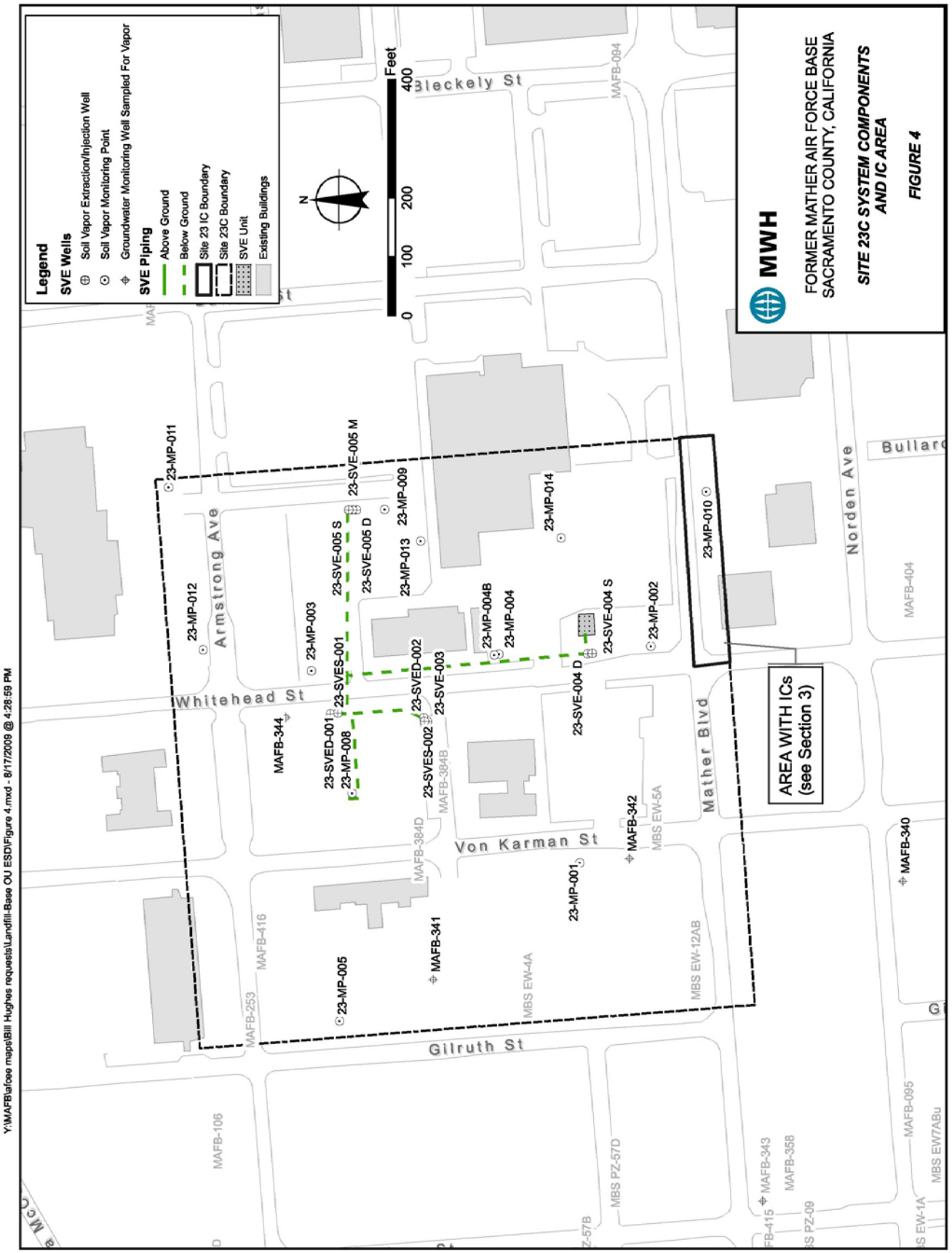
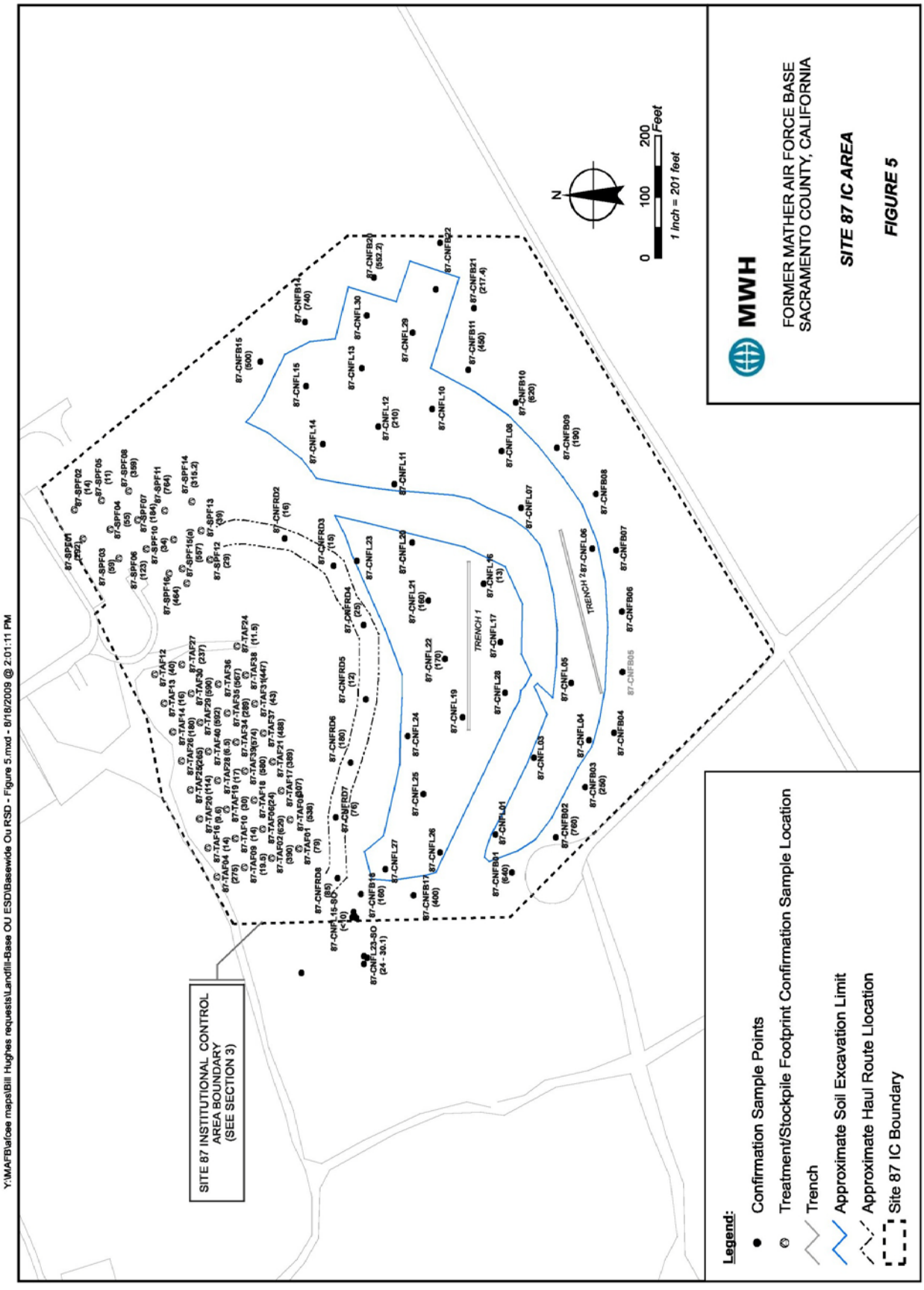


FIGURE 5: Site OT-87 IC Area



4.0 Affirmation of the Statutory Determinations

The ARARs addressed by the Basewide OU ROD are augmented by the additional ARARs identified in Table 1 of this ESD. This ESD adds ICs to Basewide OU sites to protect the remaining remedial system components and prevent exposure to contaminated soil or soil gas. Also, the narrative soil cleanup levels are applied to Site FT-10C/ST-68.

Considering the additions to the selected remedies as documented in this ESD, the USAF, U.S. EPA, and the State of California believe that these remedies are protective of human health and the environment, comply with federal and state requirements that were identified in the ROD and this ESD as ARARs, and are cost effective. In addition, the remedies continue to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable for these Basewide OU sites.

To the degree these remedies result in contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted no less frequently than each five (5) years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

5.0 Public Participation Activities

Although the remedy is modified from the original decision document, the modification is not a fundamental change in the scope or purpose of the action; therefore, a public comment period will not be conducted. A notice of availability and brief description of this ESD will be published in the *Sacramento Bee* after the ESD is signed. The ESD will become a part of the AR for the Mather Basewide OU. In addition, the topic will be discussed during the next Restoration Advisory Board meeting for Mather following issuance of the final version of the ESD.

6.0 ESD Signature Page

This ESD for the Basewide OU ROD sites is final and will be made available to the public by placement in the CERCLA Administrative Record and information repository [per NCP §§300.435(c)(2)(i)(A) and 300.285(a)(2)].

This ESD may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but all such counterparts shall together constitute one and the same document.

Decision Statement: The U.S. EPA and the USAF jointly select the remedy augmentation described in this ESD for the Basewide OU sites to impose certain ICs as land-use restrictions to protect the Basewide OU remedial system components and prevent exposure to contaminated soil or soil gas, and to change the cleanup levels for total petroleum hydrocarbons at Site 10C/68 from numerical standards to a narrative standard.

JUL 09 2010

MR. ROBERT M. MOORE
Director
Air Force Real Property Agency
U.S. Air Force

Date

8/9/2010

MR. MICHAEL M. MONTGOMERY
Assistant Director of Federal Facilities and
Site Cleanup Branch, Region 9,
U.S. Environmental Protection Agency

Date

The State of California Department of Toxic Substances Control and Central Valley Regional Water Quality Control Board had an opportunity to review and comment on this ESD for the Basewide OU sites.

8/25/10

MR. CHARLES B. RIDENOUR, P.E.
Supervising Hazardous Substances Engineer II
Sacramento Office
Brownfields & Environmental Restoration Program
Department of Toxic Substances Control

Date

7.0 References

AFBCA, 1993, Superfund Record of Decision: Aircraft Control and Warning Site, Mather Air Force Base, Sacramento County, California, December

AFBCA, 1995, Superfund Record of Decision, Landfill Operable Unit Sites, Mather Air Force Base, Sacramento County, California, July

AFBCA, 1996, Community Relations Plan, January

AFBCA, 1996, Superfund Record of Decision, Soil Operable Unit Sites and Groundwater Operable Unit Plumes, Mather Air Force Base, Sacramento County, California, April

AFBCA, 1996, Removal Action Memorandum for Site 10C, September

AFBCA, 1998, Record of Decision, Basewide Operable Unit Sites, Mather Air Force Base, California, August

AFRPA, 2006, Record of Decision, Supplemental Basewide Operable Unit Sites, Mather Air Force Base, California, October

Montgomery Watson, 1999, Draft Final Informal Technical Information Report for Remedial Actions at Sites 15, 20, 85, 86, and 87, August

USAF, 1989, Federal Facility Agreement under CERCLA Section 120, in the matter of The U.S. Department of the Air Force, Mather Air Force Base, July